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APRIL 2011  
Volume 198, No. 4

# American School

AMERICAN SCHOOL BOARD JOURNAL • THE SOURCE FOR SCHOOL LEADERS

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# Under Fire

Once nearly untouchable, teachers unions now are being portrayed as barriers to school reform. How are school boards responding?





Fourth- through 12th-grade students at Mooresville Graded School District each receive a laptop in a one-to-one computing program that has resulted in remarkable gains in student achievement and increased graduation rates. Mooresville teachers say the program has fundamentally changed the way they do their jobs.

# Connected to the Future

A North Carolina school district is transformed by a one-to-one computing program, raising student achievement and sparking creativity in classrooms and homes alike

**Lawrence Hardy**

Jessica Sheley has some less-than-fond memories of Room 203 at Mooresville High School. That's where her world history teacher used to project various pages from the textbook onto a screen with some key words whited out. Her task, and that of her ninth-grade classmates, was to fill in those missing words.

Of course, that work was made a little easier—you might say, more mind numbing—by the fact that the very same textbook would be sitting in front of every student, opened to the same page as the one projected on the screen.

"So all you'd have to do is find the word and write it in," says Sheley, still incredulous that someone could teach



that way in North Carolina in the late 1990s.

Jump to 2011, and Sheley is back in Room 203. This time she's the teacher, and she does things a little differently. For a world history segment on World War I, she had students come up with questions on an aspect of the conflict—any aspect—that *they* wanted to study. The ninth-graders created a website, posting videos and podcasts on everything from the conflict's impact on Europe and America, to the wartime roles of women and African Americans.

Sheley, an Apple Distinguished Educator and National Board Certified Teacher, is well known in the district for her ability to spark students' creativity and interest in learning. But in this small town and suburban district of 5,400 students north of Charlotte, she is hardly alone. Since the Mooresville Graded School District launched its Digital Conversion campaign in 2007—one that resulted in all fourth- through 12th-grade students receiving laptops—the district has made remarkable gains in student achievement and graduation rates.

Mooresville is one of a growing number of school districts that use laptops to fundamentally change the way teachers teach and students acquire knowledge. Ann Flynn, director of education technology at the National School Boards Association, says about one-third of the nation's schools now have "significant" one-to-one computer initiatives in place.

But, Flynn says, it's not just new laptops or iPads. In successful programs, there is a profound change in instruction and in the school's culture.

"If all teachers do is keep teaching how they've been taught," she says, "you're not going to see a change in achievement or engagement."

### Doing it the right way

A few years ago, *America's Digital Schools 2008*, a report by the Greaves Group and the Hayes Connection, found that just 33 percent of districts with one-to-one technology programs believed they made significant academic improvement from technology.

But when Project RED, a research consortium of business and education groups, issued its own report recently, it maintained that education technology done right could both improve student achievement and cut costs at federal, state, and local levels. That kind of research, Flynn says, could be invaluable in swaying those who claim they can't afford the technology.

Laptops *do* improve student engagement, she says. The problem is that it's "not enough to turn the head of a lawmaker. That's not a compelling enough argument during tight budgets."

But what about programs that raise student achieve-

ment while saving districts and states money? In its report, *The Technology Factor: Nine Keys to Student Achievement and Cost-Effectiveness*, Project RED noted that, while technology looks expensive when it's considered in isolation, it has the potential to save on a district's total budget when a variety of factors are considered. These include everything from a reduction in paperwork to savings on remedial instruction and the costs associated with students dropping out of school.

The report even came up with a national estimate on how much eventually could be saved each year if all 55 million public school students were educated in technology-transformed schools: \$3.1 trillion, or \$56,437 per students. This is based on the projected increase in tax revenues from the millions of students whom the report says would go on to have higher-paying jobs.

The report cited nine "key implementation factors" that it strongly linked to student success in the new technological classroom. These include things like regularly integrating technology into core classes, having students collaborate online, training principals in how to influence teacher buy-in, and providing online formative assessments at least weekly.

Only 1 percent of schools deployed all nine implementation factors, the report says. Four percent did eight, and 7 percent enacted nine.

At the end of the 160-plus-page report is a case study of one system that has gotten about as close as any: Mooresville Graded School District.

In Mooresville, the impact on student achievement has been dramatic. Students scoring in the proficient range on a composite of North Carolina tests increased from 73 percent in 2007-08, to 82 percent the next year, and to 86 percent in 2009-10, tying Mooresville for fourth highest in the state.

Perhaps even more impressive, the number of out-of-school suspensions has decreased 64 percent since 2006-07.

"Aside from the impressive improvements in education success, the results in Mooresville can be evaluated through the body language of the students," the Project RED report says. "The hum in the schools' hallways is energetic. The students lean forward into their laptops as they work."

That might sound a trifle over the top, but it's not unfounded. Go to a fourth-grade history class at Mooresville Intermediate, where students studying rain forests are engaged in making a "Jeopardy" game for another class. Visit a language arts class at Mooresville Middle, where students are learning about the parts of a story by using their laptops to write an alternate ending to their own works. Call an elective "Help Desk" class at the high school, where all but one of about a dozen students are girls (putting to rest the notion that troubleshooting com-

puter glitches and taking apart laptops are "boys' jobs").

In those examples and in others, you'll find that Mooresville isn't just passing out laptops—it's changing the very dynamics of the classroom.

"The box is not what's important to us," says Technology Director Scott Smith. "This is a technology project, but it's really not just that. This is a curriculum project. This is changing what goes on in the classroom."

Adds School Board Chair Karen Hart: "It has absolutely been the right thing for students. Period."

### **Making it work**

Four years ago, when Mooresville hired Mark Edwards as its superintendent, the school board knew it needed to make some big changes. The state's manufacturing economy was stagnant, and it increasingly was clear in this former mill town that a good education was the best route to stable employment and a better future.

Yet achievement in the Mooresville Graded School District had stalled and, even more troubling, the digital divide was expanding as the number of disadvantaged families grew. The district's free and reduced-price lunch population now stands at 41 percent.

Ten years ago, Edwards faced a similar digital divide as superintendent of the Henrico County Public Schools, a solid, suburban district about 10 times the size of Mooresville on the northeast edge of Richmond, Va. Henrico has about a 30 percent free and reduced-price lunch population, and Edwards' way of confronting the issue was novel at the time: Provide laptops to all middle and high school students.

Mooresville's board members knew about Edwards' work in Henrico; the laptop initiative was one of the first in the country and was highly praised and scrutinized. The board wanted the same things for Mooresville.

However, some were skeptical when Edwards recommended the district embark on a comprehensive technology program. It would provide laptops not just to middle and high school students but eventually would offer the same technology to the fourth-, fifth-, and sixth-graders at Mooresville Intermediate School.

"My concern was, is this box going to replace the teacher?" says board member Roger Hyatt. "I had to do a lot of rethinking."

In December 2007, the district distributed 500 MacBooks to teachers. In August 2008, 400 MacBooks were made available for the high school English department. Twelve months later, the district provided 4,000 laptops to students in grades four through 12.

Most of the laptops are leased for three to four years, says Terry Haas, Mooresville's chief financial officer. Their cost, and that of related technology, is about \$950,000 annu-

ally. That's a significant but not overwhelming investment in a district with a \$41 million operating budget, Haas says.

Much of that investment—about \$1 per day per student, Edwards says—has come from funds redirected from other areas, such as textbook purchases and computer labs.

Whether the laptop program eventually saves the district money—the promise offered in the Project RED report—is too soon to say. But Mooresville officials note their district is not wealthy and has to cope with one of the lowest tax rates in North Carolina. The district was 101st out of 115 districts in per-pupil funding in 2008-09, and has only recently improved its ranking to 85th.

If a district with these budget constraints can go digital, school officials emphasize, any district can.

### **Going beyond convenience**

Mooresville's plan at the outset was to familiarize teachers with the technology well before they used it in the classroom. The district held numerous training sessions as well as a summer academy.

"We learn a lot from each other," says Samone Graham, a high school biology teacher. "I think 90 percent of it is from people in the building—or from my daughter [now a tech-savvy seventh-grader]. It makes us closer as a faculty because we're all learning."

Now, Graham says, she can't imagine a class without laptops. When Mooresville had a snow day this winter right before an important end-of-quarter exam, Graham held a virtual class with more than 50 students, who conversed and asked questions via Angel, the district's learning management system.

Convenient? Yes. But the project has gone beyond mere convenience.

Teachers say it fundamentally has changed the way they do their jobs. Indeed, they add, even for some veterans it was like going back to being a new teacher. Now students direct much of their own learning. Instruction is more personalized, as teachers regularly move among individual students or small groups. If anything, many teachers say, the change has made their jobs harder but also more fulfilling.

Sheley, the high school history teacher, still lectures, but mostly by podcast so students can listen at home. Class often is reserved for more self-directed work.

Edwards recently went into an intermediate school history class; a fourth-grader suddenly quizzed him, asking him the name of the first African-American woman to run for president. The superintendent thought he knew the answer.

"Shirley Chisholm," he replied with some confidence, naming the Democratic primary candidate from 1972.

"She said, 'No. But that's a good guess. That's what most people would guess.'"

The answer, the fourth-grader informed him—having, of



## To the cloud: Using a virtual desktop infrastructure

### Eric Williams

Imagine the possibilities if your teachers and students could gain improved access to new software, updates, and Web-based resources that support teaching and learning. Imagine what your district could do if they could use your network's resources anytime, anyplace, and from any device with an Internet connection. Imagine the savings you could realize if your information technology (IT) department could easily update the desktops of computers throughout your school division.

We are moving toward these possibilities in Virginia's York County School Division with the addition of a virtual desktop infrastructure. VDI, as it is known, eventually will connect all students, teachers, and other staff to the district's network through a private Internet "cloud."

With this program, which we implemented last fall for middle and high school staff, users are no longer tethered to a specific computer at a specific site with a standardized configuration of software that is blind to their needs and interests. Each user has unique profiles for instructional software, administrative tools, and data. All that is required is Internet access.

We believe VDI will support our use of technology to engage students in rigorous learning experiences while tapping into their interest in digital tools. Since last fall, staff members at our district's eight middle and high schools have had access to the cloud. Later this spring or summer, we will finish adding elementary staff and plan to give students access after that.

The long-term result, we believe, will be higher student achievement.

#### What the cloud offers

Our heads are not in the clouds with this project. Cost is a factor for us in York County, a 12,400-student school division that includes historic Yorktown, Va. In the past two years, our district lost 17 percent of its state revenue, the largest such reduction in decades. To balance the budget, we have cut almost 50 staff positions during that period and expect to lose another 15 in 2011-12. Teachers and staff have not received raises in the past two years.



Despite our budget challenges, our long-range strategic plan is built on promoting the joy of teaching and learning. Our goal is to engage students in rigorous educational experiences rather than just to cover the necessary content that prepares them for state tests. And VDI helps us meet that goal.

With a VDI, our teachers and students will be able to gain access to new software within a day of the decision to provide access. School districts that use VDI might be able to approve additional software, because installation does not require significant human capital. Teachers and students will be able to more fully use Web-based resources because of better access to current versions of plug-ins.

Regardless of time and location, teachers and students who use VDI can easily view and update files and use the software stored on the district's network. Teachers can access their grade books, even if the files are not Web-based, or access their library's catalog of resources to identify and reserve materials.

When not in school, teachers and students can use course software, even if it is not loaded on their computers, and USB flash drives will no longer be needed to carry files between home and school. Even if the district is in a PC environment, teachers and students could use Mac computers to access files and software.

The cloud also presents some opportunities for our IT staff, who no longer will have to touch each computer to load software. Also, the IT staff will have fewer concerns about whether adding new software will break the fragile infrastructure of a computer's operating system. Individual computers no longer will have to be dedicated to particular uses because of an inability to use multiple products on the same machine.

Because VDI provides equal capacity for users, the power of the computer on a teacher's desktop is less important. Historically, IT staff members have concerns about the system software and processor speed on older computers. With VDI, the computers are just portals to the virtual environment. This allows a district to lengthen the computer replacement cycle.

As you can see, we are very enthusiastic about the possibilities that having VDI present. For our school division, the opportunity to provide greater access while saving money is—to us—a virtual no-brainer.

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## Creating your past or their future?

Don't think you're living in revolutionary times? Just think back to a mere 16 years ago, and consider what's transpired since then.

That's what Ann L. Flynn, NSBA's director of education technology, asked an audience to do this past February at a meeting of the association's Federal Relations Network (FRN) in Washington, D.C.

In 1995, "If you mentioned 'Amazon,'" Flynn said, "you were talking about a river in South America."

Amazon.com was in its infancy back then. Founded in 1994 and launched online the following year, it has transformed the way we shop.

That's Landmark No. 1 on what Flynn called the road map that is the 2010 National Education Technology Plan (NETP). Written by the U.S. Department of Education's Office of Education Technology, the plan outlines how technology must be used to help the Obama administration achieve its primary educational goals.

These goals are: raising to 60 percent the proportion of two- and four-year college graduates; and closing the achievement gap so that all students, regardless of race, income, or neighborhood, graduate from high school prepared for college and careers.

To achieve these goals, the NETP calls for "revolutionary transformation rather than evolutionary thinking." So there you have it: revolution.

But back to our travelogue. Landmark No.2, Flynn said, is Google, which began in 1996 (in a garage) as a research project for two Stanford University graduate students. "It has transformed how we search for and use information," she said.

Landmark No. 3 is Facebook. Launched in 2004, it now has more than 500 million users worldwide. "It has transformed the way we connect and communicate," Flynn said.

We shop differently, we search for and use information differently, and we connect and communicate with people differently. Is it any wonder that we are learning differently too?

Education technology can help put students at the center of the learning process, Flynn said. It can engage them perhaps as never before. It can prepare them for careers we can't even envision today.

Challenging FRN members to get beyond preconceived notions about what constitutes a "class," or a "school," or even "education," Flynn concluded: "Are you creating your past—or their future?"



course, looked it up on the Internet—is left-wing political activist and third-party candidate Charlene Mitchell in 1968.

That story speaks to the kind of empowerment and confidence that technology can help instill in students. In such an environment, teachers must learn to "trust kids like you never have before," says Todd Wirt, principal of Mooresville High School. "The scary thing is giving up control."

### Connecting to the future

Of course, a fourth-grader cannot be totally in charge of her own education. Any technology, be it a laptop or interactive whiteboards (which are used in Mooresville's primary and intermediate schools) are only as good as the teacher who directs its use; a superficial exercise online is no better than a superficial exercise on paper. And teachers like Sheley say that, yes, they still talk in front of the classroom; there are times when that's the most efficient method of instruction.

But Mooresville teachers also say that, through collaboration with colleagues and their own exploration, they continually find new ways to integrate technology.

"I'll have kids come up to me and say, 'I spent three hours on my iMovie last night,'" says Wirt. "I've never heard a kid say, 'I spent three hours on my poster.'"

Parents agree.

"I've just been amazed at how quickly they pick this stuff up," says Lisa Gill, who has children in elementary, intermediate, and middle school. "A lot of people thought the technology was going to stifle their creativity. For my daughter, it's just channeling it a different way."

Over the weekend, for example, the homework "will morph into 'Maybe I'll make an iMovie about this,'" Gill says. "I don't want an iMovie unless the house is clean."

For families that can't afford the nominal \$50-per-laptop fee, a district foundation picks up the tab. Last summer, on one of the hottest days of the year, Edwards met a woman outside the district office who was raising three school-age grandchildren. After he asked her to come inside where it was cooler, she told him: "I've saved \$42 and I know I need money for each child, but I don't have it yet."

When Edwards told her the foundation would pay the cost, she replied: "I am so thankful. We've never had a computer in our house."

Now they have three. For Edwards, that conversation finally clarified what the impact of technology could be—for all children.

"It is about engagement," he says. "And I think the relevant fact is, whether they are sixth-graders or 12th-graders, they see this tool as connected to the future." ■

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